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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/075,167	ZUCKER, JERRY	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14-33 and 35-42* is/are pending in the application.

4a) Of the above claim(s) *3-12,26-32,36-39 and 42* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 14-25, 33, 35 and 40-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This office paper is in response to the amendment filed 05/06/04. The applicant has overcome the art rejections; and the statutory type double patenting for certain claims. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. However, the present application is finally rejected over new art as seen below.

Election/Restrictions

1. This application contains claims 3-12, 26-32, 36-39 and 42 drawn to an invention nonelected with traverse in the reply filed as paper # 7. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Double Patenting

NOTE: Potential Double Patenting:

Applicant is advised that if during the prosecution of the present Application No. 10/075167 (*US Publication No: US 2003/0054233*) the invention of claim 1 is shifted to also claim the invention of claims 3-4 (now withdrawn from consideration):

i) claims 1 and 3-4 of the present application might be provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1 and 4 of copending Application No. 09/957602.

The copending application '602 claims the following (claims 1 and 4):

1. (Currently amended) A battery separator comprising at least one fibrous layer consisting essentially of glass fibers and at least one support layer, wherein said support layer is formed of an acid-resistant material and comprises a plurality of macroscopic openings having diameters larger than 50 μm and penetrating the whole thickness of said support layer providing direct ionic transfer through said support laver via straight paths extending substantially perpendicular to the extended plane of said support laver.

4. (Withdrawn) A battery separator according to claim 3, wherein the fibrous layers comprise 20 to 40 % by weight of glass microfibers having an average diameter of less than 1 gm and 60 to 80 % by weight of coarse glass fibers having an average diameter of about 3 μm.

The foregoing will be applicable unless applicant cancels or amends the potentially conflicting claims so they are no longer coextensive in scope; and/or properly addresses and resolves the double patenting rejections.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 18-25, 35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of the Japanese publication JP 11-167910 (hereinafter referred to as "*the JP'910 publication*").

The present application is directed to a battery separator wherein the disclosed inventive concept comprises the specific acid resistant material layer and its macroscopic openings. Other limitations include the specific pore size; the layer thickness; the specific porosity; the opening spacing; the edges for sealing; the diameter; the holes/slots and the pocket shape.

With respect to claim 1:

Aidman et al disclose a battery plate separator system including three layers in face-to-face relationship, the first and third layers including a porous mat of fibers and between the first and third layers, a second layer comprising a porous organic polymeric sheet with pores (ABSTRACT). It is disclosed that the first and third layers comprise porous mat made of fibers made of glass wherein these mats preferably have a porosity of at least about 90 % (COL 1, lines 43-51). *It is noted that Aidman et al disclose two (2) porous fibrous layers and one (1) porous polymeric layer, thus, either one of the two porous fibrous layer or the porous polymeric layer acts as the support layer in the separator system; in addition, the three (3) layers do have openings or pores because they all are porous.* Aidman et al also disclose that the separators are to be used in lead-acid batteries (COL 1, lines 37-40/COL 1, lines 43-46) as well as that the separator system is inert to the electrolyte (COL 2, lines 3-5). *Thus, the layered separator system of Aidman et al is an acid-resistant material.*

With reference to claims 18-19:

Aidman et al disclose that the first and third layers comprise porous mats made of fibers wherein these fibers are made of glass and an organic polymeric material such as polyethylene or polypropylene (COL 1, lines 45-50). *Thus, the fibrous layer comprises fibers of glass and fibers of an organic polymeric material.*

As for claim 20:

Aidman et al teach in EXAMPLE 1 that the porous fibrous mats have a thickness of 0.013 inch (0.3302 mm); the flat porous thermoplastic sheet measures 0.010 inch (0.254 mm) in thickness (COL 2, lines 65 to COL 3, lines 2). Two additional batteries were made wherein each separator system contained the porous fibrous mat has a thickness of 0.026 inch (0.6604 mm) (COL 3, lines 12-16).

With respect to claims 21-24:

It is disclosed that the first and third layers comprise porous mat made of fibers made of glass wherein these mats preferably have a porosity of at least about 90 % (COL 1, lines 43-51). *Thus, the openings of the layers cover more than 60 %, 70%, 80% and 90%.*

As for claim 25:

Aidman et al disclose the layers comprising porous made of fibers having a porosity of at least about 90 % (COL 1, lines 50-51). *It is thus noted that the specific spacing of the openings is inherent because in embodiments comprising an open area in excess of 90 %, the openings are accordingly formed in closely spaced relationship and separated only by thin land areas of material so as to meet the claimed space or distance between two openings. In this regard, attention is directed to applicant's disclosure (page 15, third full-paragraph) wherein it is recognized that when the open area is more than 90 %, the openings are closely spaced between one another. Hence, since Aidman et al's layers have a porosity of at least 90 %, the opening spacing in the separator of Aidman et al does exhibit the same spacing characteristic.*

As for claim 35:

Aidman et al disclose that layers are comprises porous mats or porous sheets (COL 1, lines 46-47/ COL 1, lines 52-54). *It is noted that since the mats or sheets are porous they possess or have pores, and thus, pores are minute openings by which matter passes through a membrane, thus, the openings of the layer, at least, have the form of holes.*

As for claim 40:

Aidman et al teach in EXAMPLE 1 that the porous fibrous mats have a thickness of 0.013 inch (0.3302 mm); the flat porous thermoplastic sheet measures 0.010 inch (0.254 mm) in thickness (COL 2, lines 65 to COL 3, lines 2). Two additional batteries were made wherein each separator system contained the porous fibrous mat has a thickness of 0.026 inch (0.6604 mm) (COL 3, lines 12-16).

Aidman et al disclose a separator system comprising layers according to the above-mentioned aspects. However, Aidman et al do not expressly disclose the specific opening diameter of separator.

The JP'910 publication a lead-acid battery comprising a separator having an interpole diameter dimension of less than 1 mm (ABSTRACT). *It is noted that since the plate is porous it possesses or has pores, and thus, pores are minute openings by which matter passes through a membrane, thus, the openings of the layer, at least, have the form of holes.*

As to the limitation of "penetrating the whole thickness of said support layer providing direct ionic transfer through said support laver via straight paths extending substantially perpendicular to the extended plane of said support layer", it asserted that having shown the support layer of the prior art meets the specific opening diameter dimension, the above-mentioned characteristic, property and/or function (i.e. providing direct ionic transfer via

*straight paths) is thus inherent as the structure recited in the reference is substantially identical to that of the claims, and therefore, claimed properties, characteristics or functions are presumed to be inherent (**MPEP 2112. Requirements of Rejection Based on Inherency**). Thus, the prior art embodied separator seems to be identical except that the prior art is silent as to an inherent function, property and/or characteristic. In that, it is noted that the extrinsic evidence makes clear that the missing descriptive matter is necessarily present in the separator described in the reference, and that it would be so recognized by persons of ordinary skill.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific opening diameter of separator of the JP'910 publication in the separator of Aidman et al as the JP'910 publication discloses that such separators having a specific maximum interpole diameter dimension allows to attain high output without sacrificing service life performance. Accordingly, it would have been obvious to those of ordinary skill in the art at the time the invention was made to make Aidman et al's separator having the claimed opening diameter because even though the JP'910 publication' opening diameter does not overlap or lie inside the claimed opening diameter (*i.e. claimed range: larger than 1 mm, and disclosed range: less than 1 mm*), a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metal Corp. of America v. Banner 227 USPQ 773.* Moreover, the normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine a satisfactory and optimum opening diameter.

Moreover, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed feature and a feature having the claimed relative dimensions would not perform differently than the prior art device/element/member, the claimed device/element/member is not patentably distinct from the prior art device. That is, limitations relating to the size of the feature/element/member are not sufficient to patentably distinguish over the prior art as it is noted that changes in size is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular size of the claimed opening diameter is significant. In re Rose 105 USPQ 237; In re Rinehart 189 USPQ 143; In Gardner v. TEC Systems, Inc., 220 USPQ 777 & 225 USPQ 232, ***(See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale)***

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of the Japanese Publication JP 11-167910 (hereinafter referred to as "*the JP'910 publication*") as applied to claim 1 above, and further in view of Okada et al 4725516.

Aidman et al and the JP'910 publication are applied, argued and incorporated herein for the reasons above. In addition, Aidman et al and the JP'910 publication do not disclose the specific average pore size of the separator layer.

Okada et al teach a battery separator having an average pore diameter of about 7 μm (CLAIM 7/COL 6, lines 11-15); or an average pore diameter of about 3 μm (COL 6, lines 11-15).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific average pore size (diameter) of the separator layer of

Okada et al in the separator layer of both Aidman et al and the JP'910 publication as Okada et al teach that by selecting appropriately the separators within the suitable claimed range of pore diameter an improved distribution of the electrolyte content of the cell element is achieved. Thus, it allows constructing sized plates comprising a larger amount of electrolyte contained in the positive and negative active materials than that in the separators, so that the amount of electrolyte in the positive and negative active materials does not decrease and the total volume of electrolyte in the cell is not reduced due to overcharging conditions. Further, separators having the specific pore diameter distribution possess electrolyte absorption properties and retention capabilities which are desirable in order to establish the condition that only the electrolyte in the separators decreases and the electrolyte in the positive and negative plates remains filling them when the total amount of electrolyte is decreased. Thus, the electrolyte absorption and retention power of separator is enhanced.

5. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of the Japanese Publication JP 11-167910 (hereinafter referred to as "*the JP'910 publication*") as applied to claim 1, above, and further in view of Waterhouse 4363856.

Aidman et al and the JP'910 publication are applied, argued and incorporated herein for the reasons above. In addition, Aidman et al and the JP'910 publication do not disclose the specific diameter of the glass fiber and polymeric fiber.

As to claims 14-15:

Waterhouse discloses a battery separator wherein glass fibers may be incorporated into the battery separator material, preferably, the glass fibers have fiber diameters less than 20

microns as the mean diameter. Exemplary of the glass fibers are the glass microfibers, those having fiber diameters of 0.20 to 4.0 microns (COL 2, lines 52-66).

As to claims 16-17:

Waterhouse discloses a battery separator material comprising polyolefin fibers such as polyethylene, polypropylene and have a fiber diameter of up to 100 microns; preferably, these polyolefin fibers have a fiber diameter of 0.01 to 20 microns (ABSTRACT/COL 2, lines 9-20). **EXAMPLE 1** shows the use of a polymeric fiber with an average fiber diameter of 4.9 microns (COL 6, lines 20-24).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the glass fiber of both Aidman et al and the JP'910 publication by having the specific glass fiber diameter of Waterhouse as Waterhouse teaches that exemplary of the glass fibers useful in the practice of his invention are the glass microfibers having fiber diameters of 0.20-4.0 micron because these glass fibers, when incorporated into the battery separator material per se, impart rigidity and tensile strength while maintaining the inert chemical characteristics and low ohmic resistance of the battery separator. Thus, the prior art reference directly teaches the use of glass fiber diameters within the claimed range *(SEE MPEP 2144.05 Obviousness of Ranges and In re Geisler 43 USPQ2d 1362).*

With respect to the specific diameter of the polymeric fiber, it would have been obvious to one skilled in the art at the time the invention was made to make the polymeric fiber of both Aidman et al and the JP'910 publication by having the specific polymeric fiber diameter of Waterhouse because Waterhouse teaches that preferably these polyolefins fibers have a fiber diameter of 0.01 to 20 microns because these polyolefin fibers (polymeric fibers) are suitable to

be used as separator material because they have low ohmic resistance due to their diameter and have sufficient flexibility so that the final battery separator material can be folded and worked while providing good envelope integrity and ease of processing on papermaking equipment. Hence, there is provided a separator material having excellent filtering, electrical, chemical and physical properties. Thus, the prior art reference directly teaches the use of polymeric fiber diameters within the claimed range *(SEE MPEP 2144.05 Obviousness of Ranges and In re Geisler 43 USPQ2d 1362).*

6. Claims 33 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of the Japanese Publication JP 11-167910 (hereinafter referred to as "*the JP'910 publication*") as applied to claim 1 above, and further in view of Fraser-Bell et al US 2002/0106557.

Aidman et al and the JP'910 reference are applied, argued and incorporated herein for the reasons above. In addition, Aidman et al and the JP'910 publication do not disclose the specific edge regions for sealing and the separator having the form of a pocket.

With respect to claims 33 and 41:

Fraser-Bell et al disclose a separator assembly wherein if the user wishes to seal the separator assembly such that the separator assembly fully envelopes the electrode, the width of the second layer may be greater than the width of the electrode and the width of the first layer (SECTION 0033). In such an embodiment, the longitudinal edges of the second layer would extend beyond longitudinal edges 26 of the electrode and the longitudinal edges of the first layer so that the longitudinal edges of the second layer, which are in face-to-face relationship after

being folded around the electrode (SECTION 0033), may be bonded to each other and thereby form a pouch around the fully envelope electrode. The fully envelope electrode may be sealed along the lower portion, the upper portion, or along the longitudinal side edges of the electrode/separator assembly combination (SECTION 0033). *It is noted that a pouch has a pocket/bag shape with an open top, a closed-bottom and closed sides.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific edge regions of Fraser-Bell et al in the separator layer of both Aidman et al and the JP'910 publication because Fraser-Bell et al teach that if the user wishes to seal the separator assembly such that the separator assembly fully envelopes the electrode, the width of the second layer may be greater than the width of the electrode and the width of the first layer, that is to say, the longitudinal edges of the second layer would extend beyond longitudinal edges of the electrode and the longitudinal edges of the first layer so that the longitudinal edges of the second layer may be bonded to each other. Thus, the edges region of the separator assists to seal and bond the electrode/separator assembly.

As to the specific the separator having the form of a pocket, it would have been obvious to one skilled in the art at the time the invention was made to make the separator of both Aidman et al and the JP'910 publication by having specific form of a pocket (pouch) of Fraser-Bell et al because Fraser-Bell et al teach that the pocket (pouch) shaped separator serve to fully envelope the electrode, thereby enhancing the sealing of the electrode/separator assembly.

7. Claims 1, 18-25, 35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of Yata et al 2004/0048152.

The present application is directed to a battery separator wherein the disclosed inventive concept comprises the specific acid resistant material layer and its macroscopic openings. Other limitations include the specific pore size; the layer thickness; the specific porosity; the opening spacing; the edges for sealing; the diameter; the holes/slots and the pocket shape.

With respect to claim 1:

Aidman et al disclose a battery plate separator system including three layers in face-to-face relationship, the first and third layers including a porous mat of fibers and between the first and third layers, a second layer comprising a porous organic polymeric sheet with pores (ABSTRACT). It is disclosed that the first and third layers comprise porous mat made of fibers made of glass wherein these mats preferably have a porosity of at least about 90 % (COL 1, lines 43-51). *It is noted that Aidman et al disclose two (2) porous fibrous layers and one (1) porous polymeric layer, thus, either one of the two porous fibrous layer or the porous polymeric layer acts as the support layer in the separator system; in addition, the three (3) layers do have openings or pores because they all are porous.* Aidman et al also disclose that the separators are to be used in lead-acid batteries (COL 1, lines 37-40/COL 1, lines 43-46) as well as that the separator system is inert to the electrolyte (COL 2, lines 3-5). *Thus, the layered separator system of Aidman et al is an acid-resistant material.*

With reference to claims 18-19:

Aidman et al disclose that the first and third layers comprise porous mats made of fibers wherein these fibers are made of glass and an organic polymeric material such as polyethylene or

polypropylene (COL 1, lines 45-50). *Thus, the fibrous layer comprises fibers of glass and fibers of an organic polymeric material.*

As for claim 20:

Aidman et al teach in EXAMPLE 1 that the porous fibrous mats have a thickness of 0.013 inch (0.3302 mm); the flat porous thermoplastic sheet measures 0.010 inch (0.254 mm) in thickness (COL 2, lines 65 to COL 3, lines 2). Two additional batteries were made wherein each separator system contained the porous fibrous mat has a thickness of 0.026 inch (0.6604 mm) (COL 3, lines 12-16).

With respect to claims 21-24:

It is disclosed that the first and third layers comprise porous mat made of fibers made of glass wherein these mats preferably have a porosity of at least about 90 % (COL 1, lines 43-51). *Thus, the openings of the layers cover more than 60 %, 70%, 80% and 90%.*

As for claim 25:

Aidman et al disclose the layers comprising porous made of fibers having a porosity of at least about 90 % (COL 1, lines 50-51). *It is thus noted that the specific spacing of the openings is inherent because in embodiments comprising an open area in excess of 90 %, the openings are accordingly formed in closely spaced relationship and separated only by thin land areas of material so as to meet the claimed space or distance between two openings. In this regard, attention is directed to applicant's disclosure (page 15, third full-paragraph) wherein it is recognized that when the open area is more than 90 %, the openings are closely spaced between one another. Hence, since Aidman et al's layers have a porosity of at least 90 %, the opening spacing in the separator of Aidman et al does exhibit the same spacing characteristic.*

As for claim 35:

Aidman et al disclose that layers are comprises porous mats or porous sheets (COL 1, lines 46-47/ COL 1, lines 52-54). *It is noted that since the mats or sheets are porous they possess or have pores, and thus, pores are minute openings by which matter passes through a membrane, thus, the openings of the layer, at least, have the form of holes.*

As for claim 40:

Aidman et al teach in EXAMPLE 1 that the porous fibrous mats have a thickness of 0.013 inch (0.3302 mm); the flat porous thermoplastic sheet measures 0.010 inch (0.254 mm) in thickness (COL 2, lines 65 to COL 3, lines 2). Two additional batteries were made wherein each separator system contained the porous fibrous mat has a thickness of 0.026 inch (0.6604 mm) (COL 3, lines 12-16).

Aidman et al disclose a separator system comprising layers according to the above-mentioned aspects. However, Aidman et al do not expressly disclose the specific opening diameter of separator.

Yata et al disclose a separator being a micro-porous film having a pore diameter of 5 mm or less or preferably having a pore diameter of 2 mm or less (SECTION 0259). In addition, Yata et al mention and discuss the lead-acid battery environment (SECTION 0002, 0020 and 0025). *It is noted that since the plate is porous it possesses or has pores, and thus, pores are minute openings by which matter passes through a membrane, thus, the openings of the layer, at least, have the form of holes.*

As to the limitation of "penetrating the whole thickness of said support layer providing direct ionic transfer through said support laver via straight paths extending substantially

*perpendicular to the extended plane of said support layer", it asserted that having shown the support layer of the prior art meets the specific opening diameter dimension, the above-mentioned characteristic, property and/or function (i.e. providing direct ionic transfer via straight paths) is thus inherent as the structure recited in the reference is substantially identical to that of the claims, and therefore, claimed properties, characteristics or functions are presumed to be inherent (**MPEP 2112. Requirements of Rejection Based on Inherency**). Thus, the prior art embodied separator seems to be identical except that the prior art is silent as to an inherent function, property and/or characteristic. In that, it is noted that the extrinsic evidence makes clear that the missing descriptive matter is necessarily present in the separator described in the reference, and that it would be so recognized by persons of ordinary skill.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific opening diameter of separator of Yata et al in the separator of Aidman et al as Yata et al disclose that the claimed pore diameter when used in separators helps to compensate a disadvantage that a slight short circuit easily occurs when the battery is manufactured or charged or discharged because the separator has a comparatively large pore diameter and a high porosity. Therefore, a case in which the pore diameter of the separator exceeds 5 mm is not preferable because it is impossible to compensate the above-disadvantage. *Thus, Yata et al directly teach the use of separators having pore diameter within the claimed range.* In addition, Yata et al mention and discuss the lead-acid battery environment. Moreover, the two references are found to be pertinent to each other as they both address the same problem of providing suitable separators having pore/opening diameters for battery systems.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of Yata et al 2004/0048152 as applied to claim 1 above, and further in view of Okada et al 4725516.

Aidman et al and Yata et al are applied, argued and incorporated herein for the reasons above. In addition, Aidman et al and Yata et al do not disclose the specific average pore size of the separator layer.

Okada et al teach a battery separator having an average pore diameter of about 7 μm (CLAIM 7/COL 6, lines 11-15); or an average pore diameter of about 3 μm (COL 6, lines 11-15).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific average pore size (diameter) of the separator layer of Okada et al in the separator layer of both Aidman et al and Yata et al as Okada et al teach that by selecting appropriately the separators within the suitable claimed range of pore diameter an improved distribution of the electrolyte content of the cell element is achieved. Thus, it allows constructing sized plates comprising a larger amount of electrolyte contained in the positive and negative active materials than that in the separators, so that the amount of electrolyte in the positive and negative active materials does not decrease and the total volume of electrolyte in the cell is not reduced due to overcharging conditions. Further, separators having the specific pore diameter distribution possess electrolyte absorption properties and retention capabilities which are desirable in order to establish the condition that only the electrolyte in the separators decreases and the electrolyte in the positive and negative plates remains filling them when the

total amount of electrolyte is decreased. Thus, the electrolyte absorption and retention power of separator is enhanced.

9. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of Yata et al 2004/0048152 as applied to claim 1, above, and further in view of Waterhouse 4363856.

Aidman et al and Yata et al are applied, argued and incorporated herein for the reasons above. In addition, Aidman et al and Yata et al do not disclose the specific diameter of the glass fiber and polymeric fiber.

As to claims 14-15:

Waterhouse discloses a battery separator wherein glass fibers may be incorporated into the battery separator material, preferably, the glass fibers have fiber diameters less than 20 microns as the mean diameter. Exemplary of the glass fibers are the glass microfibers, those having fiber diameters of 0.20 to 4.0 microns (COL 2, lines 52-66).

As to claims 16-17:

Waterhouse discloses a battery separator material comprising polyolefin fibers such as polyethylene, polypropylene and have a fiber diameter of up to 100 microns; preferably, these polyolefin fibers have a fiber diameter of 0.01 to 20 microns (ABSTRACT/COL 2, lines 9-20). **EXAMPLE 1** shows the use of a polymeric fiber with an average fiber diameter of 4.9 microns (COL 6, lines 20-24).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the glass fiber of both Aidman et al and Yata et al by having the

specific glass fiber diameter of Waterhouse as Waterhouse teaches that exemplary of the glass fibers useful in the practice of his invention are the glass microfibers having fiber diameters of 0.20-4.0 micron because these glass fibers, when incorporated into the battery separator material per se, impart rigidity and tensile strength while maintaining the inert chemical characteristics and low ohmic resistance of the battery separator. Thus, the prior art reference directly teaches the use of glass fiber diameters within the claimed range *(SEE MPEP 2144.05 Obviousness of Ranges and In re Geisler 43 USPQ2d 1362).*

With respect to the specific diameter of the polymeric fiber, it would have been obvious to one skilled in the art at the time the invention was made to make the polymeric fiber of both Aidman et al and Yata et al by having the specific polymeric fiber diameter of Waterhouse because Waterhouse teaches that preferably these polyolefins fibers have a fiber diameter of 0.01 to 20 microns because these polyolefin fibers (polymeric fibers) are suitable to be used as separator material because they have low ohmic resistance due to their diameter and have sufficient flexibility so that the final battery separator material can be folded and worked while providing good envelope integrity and ease of processing on papermaking equipment. Hence, there is provided a separator material having excellent filtering, electrical, chemical and physical properties. Thus, the prior art reference directly teaches the use of polymeric fiber diameters within the claimed range *(SEE MPEP 2144.05 Obviousness of Ranges and In re Geisler 43 USPQ2d 1362).*

10. Claims 33 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aidman et al 5376477 in view of Yata et al 2004/0048152 as applied to claim 1 above, and further in view of Fraser-Bell et al US 2002/0106557.

Aidman et al and Yata et al are applied, argued and incorporated herein for the reasons above. In addition, Aidman et al and Yata et al do not disclose the specific edge regions for sealing and the separator having the form of a pocket.

With respect to claims 33 and 41:

Fraser-Bell et al disclose a separator assembly wherein if the user wishes to seal the separator assembly such that the separator assembly fully envelopes the electrode, the width of the second layer may be greater than the width of the electrode and the width of the first layer (SECTION 0033). In such an embodiment, the longitudinal edges of the second layer would extend beyond longitudinal edges 26 of the electrode and the longitudinal edges of the first layer so that the longitudinal edges of the second layer, which are in face-to-face relationship after being folded around the electrode (SECTION 0033), may be bonded to each other and thereby form a pouch around the fully envelope electrode. The fully envelope electrode may be sealed along the lower portion, the upper portion, or along the longitudinal side edges of the electrode/separator assembly combination (SECTION 0033). *It is noted that a pouch has a pocket/bag shape with an open top, a closed-bottom and closed sides.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific edge regions of Fraser-Bell et al in the separator layer of both Aidman et al and Yata et al because Fraser-Bell et al teach that if the user wishes to seal the separator assembly such that the separator assembly fully envelopes the electrode, the width

of the second layer may be greater than the width of the electrode and the width of the first layer, that is to say, the longitudinal edges of the second layer would extend beyond longitudinal edges of the electrode and the longitudinal edges of the first layer so that the longitudinal edges of the second layer may be bonded to each other. Thus, the edges region of the separator assists to seal and bond the electrode/separator assembly.

As to the specific the separator having the form of a pocket, it would have been obvious to one skilled in the art at the time the invention was made to make the separator of both Aidman et al and Yata et al by having specific form of a pocket (pouch) of Fraser-Bell et al because Fraser-Bell et al teach that the pocket (pouch) shaped separator serve to fully envelope the electrode, thereby enhancing the sealing of the electrode/separator assembly.

Response to Amendment

11. Applicant's arguments, see the amendment filed 05/06/04 for specific details, with respect to the art rejection have been fully considered and are persuasive. Therefore, the rejection has been overcome. However, upon further consideration, a new ground(s) of rejection is made as set forth above. Accordingly, applicant's arguments with respect to claims 1-2, 14-25, 33, 35 and 40-41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
Art Unit 1745